

A REVIEW OF THE NORTH AMERICAN SPECIES OF *DIENOPLUS*
(HYMENOPTERA: SPHECIDAE)

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The genus *Dienoplus* W. Fox occurs in many parts of the world, but seems to be absent in South America and Australia. Most of the described species were originally placed in *Gorytes* or its synonym, *Harpactus*. Characters and habits of the 54 previously known species were discussed by Bohart (1976). The New World fauna has been known from four species ranging from Florida to California. I am describing five additional ones herein. Our species divide almost equally into two groups, recognized by their markings. The *gyponae* group has the body extensively red, with white spots on terga II and V. The *pictifrons* group typically has the head and thorax black, the abdomen red. Occasionally, males of the second group may be all black. Although the palearctic generotype, *laevis* (Latreille) is somewhat darker than our species of the *gyponae* group, the distribution of white markings on the abdomen indicates a close relationship. Other Old World species in the same group (that I have seen) are *annulatus* (Eversmann), *decipiens* (Arnold), *histrion* (Saussure), *moravicus* (Šnoflak), *ornatus* (F. Smith), *tumidus* (Panzer), and *vicarius* (Handlirsch). Of these, only *annulatus* and *moravicus* have the pale stigma found in New World species of the group.

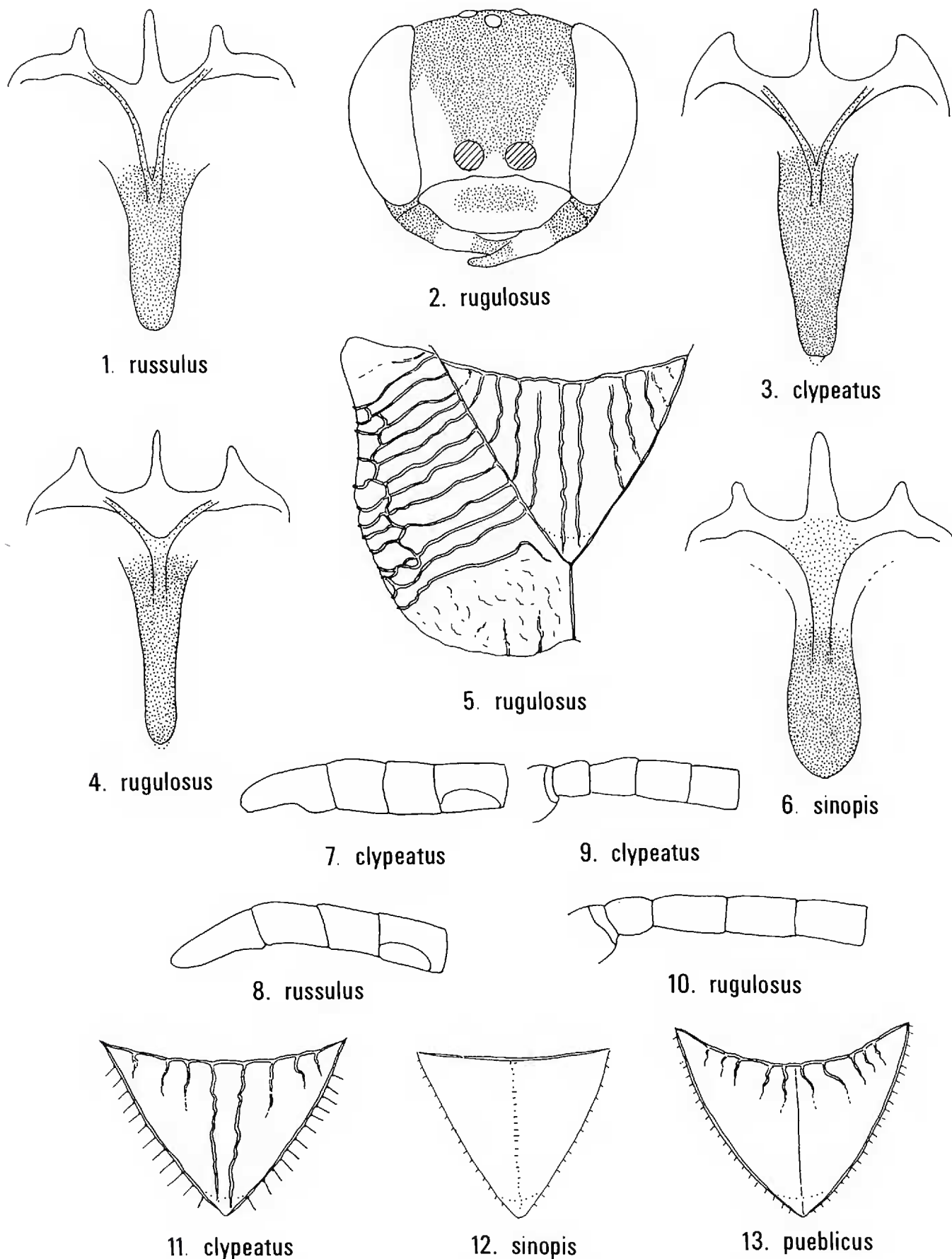
Most of the nearly 1000 specimens studied are in the collection of the University of California. Critical types and some additional material came from Academy of Natural Sciences at Philadelphia, American Museum of Natural History, National Museum of Natural History in Washington, University of Kansas, and California Academy of Sciences.

The few publications of consequence on American *Dienoplus* are Handlirsch (1893) (description of *D. mendicus* from British Columbia, p. 278), Fox (1894) (description of *D. pictifrons*, pp. 549-550), Williams (1914) (description and habits of *D. gyponae*, pp. 223-230), Krombein (1954) (description of *citipes* and comparison with *gyponae*, pp. 20-23), and Bohart (1976) (generic synopsis and synonymic list, pp. 495-496).

In the interest of brevity, articles of the antennal flagellum have been designated F-I, F-II, etc; terga T-I, T-II, etc.; and sterna S-I, S-II, etc. The last visible sternum in the male often resembles a blunt sting. This is S-VIII and its shape has considerable specific value (Figs. 1, 3, 4, 6).

Key to American Species of *Dienoplus*

1. Abdomen red to black but without white markings, forewing stigma dark 2
 Abdomen extensively light brownish red with a pair of white spots on T-II and a median one on T-V; forewing stigma whitish or whitish yellow 5
2. Male F-I more than 1.5 times as long as broad (Fig. 10), considerably longer than ocellocular distance; female clypeus with dark markings or all black; propodeal enclosure with inconspicuous silvery pubescence 3
 Male F-I less than 1.5 times as long as broad, about as long as ocellocular distance; female clypeus all yellow *or* propodeal enclosure conspicuously silvery 4
3. Propodeum extensively carinulate over enclosure and adjacent rounded area lateral to it (Fig. 5), male abdomen extensively black but T-I–II usually mostly red, female frons with well defined macropunctures (Utah and west) *rugulosus* Bohart
 Propodeum lateral to enclosure sparingly or finely carinulate, enclosure sometimes nearly smooth; male abdomen nearly all red; female frons with indistinct macropunctures (Wyo., Utah, Colo., Ariz., and west) *pictifrons* W. Fox
4. Clypeus in both sexes all yellow; propodeal enclosure not unusually pubescent, with a central furrow which is usually better defined than rest of sculpture (Fig. 11) (western U.S.) *clypeatus* Bohart
 Clypeus with a pair of black spots, a black band, or (in some females) all black; propodeal enclosure with rather dense silvery pubescence which obscures sculpture in some views (Utah, Colo., and west) *mendicus* (Handlirsch)
5. Propodeal enclosure with a median longitudinal groove defined on either side by carinulae (as in Fig. 11), mesopleuron with considerable coarse punctation, hindtibia without a distinct white area posterobasally 6
 Propodeal enclosure with a median seam (Figs. 12, 13), rarely bordered by short and anterior carinulae (Fig. 13), other characters various 7
6. Female metanotum with short black pubescence, imparting a sooty appearance; T-II with medium to medium coarse punctation in lateral view (U.S. and Mex. mostly west of 98th meridian)
 *gyponae* (Williams)
 Female metanotum with silvery pubescence; T-II with fine to medium-fine punctation (Fla.) *citipes* Krombein



Figs. 1-13. Figs. 1, 3, 4, 6. Male Sternum VIII. Fig. 2. Male face. Fig. 5. Propodeal enclosure and left side of propodeum, dorsal. Figs. 7-8. Last four male flagellomeres, lateral. Figs. 9-10. Pedicel and basal three male flagellomeres, inner lateral. Figs. 11-13. Propodeal enclosure, male holotypes.

7. Mesopleuron with numerous coarse, separated punctures; hindtibia without a distinct posterobasal pale spot; male S-VIII unusually narrow and parallel sided distad (as in Fig. 4) (Puebla, Guanajuato, Mex.) *pueblicus* Bohart
 Mesopleuron with scarcely any coarse punctures, at least male hindtibia with a basoposterior pale spot; male S-VIII slightly to strongly broadened distad (Figs. 1, 6) 8
8. Male S-VIII strongly broadened distad (Fig. 6); male sterna IV-VI or V-VI nearly always darkened; male hindtibia but not female with a small, yellowish-white posterobasal spot; female F-VI-X all dark (Calif.) *sinopsis* Bohart
 Male S-VIII slightly broadened distad (Fig. 1); male sterna IV-VI not darkened; hindtibia in both sexes with a prominent, white posterobasal spot; female F-VI-X not all dark (Colo., Ks., and west; Chihuahua) *russulus* Bohart

***Dienoplus clypeatus*, new species**

(Figs. 3, 7, 9, 11)

Male holotype.—Length 5 mm; head and thorax black; T-I posteriorly, T-II, S-II, red; mandible partly, labrum, clypeus, broad lateral bands on frons, scape beneath, tibiae in front, yellow; flagellum light brownish red, darker above; tarsi brown; wings nearly clear, marginal cell somewhat dusky, veins and stigma dark brown. Pubescence silvery, inconspicuous. Punctuation fine and scattered, especially visible on scutum, mesopleuron and T-II laterally. F-I about 1.2 times as long as wide, shorter than F-II, F-XI almost angularly depressed beneath (Fig. 7); propodeal enclosure with a median sulcus bordered on either side by a carinula, other short carinulae from anterior margin of enclosure (Fig. 11); S-VIII slightly broadened (Fig. 3).

Female.—Length 5–6 mm; about as in male except: hindtibia mostly dark; abdomen usually all red beyond extreme base; pygidial plate microsculptured, with coarse and irregular punctuation.

Holotype male (UCD), Samuel Springs (now Berryessa Lake), Napa Co., California, May 13, 1956 (R. M. Bohart). Paratypes, 18 males, 13 females, topotypical, May 9–29 (E. Schlinger, R. Bechtel, R. Bohart). Other paratypes, 8 males, 37 females, Arroyo Seco Camp, Monterey Co., California, May 11–June 6 (A. Menke, F. Parker, D. Burdick, L. Stange, R. Bohart). Other material, 37 males, 31 females, mostly from Upper Sonoran Life Zone localities on either side of the Sacramento-San Joaquin Valley. Exceptional records are Claremont, Los Angeles Co., California; Pullman and Tyler, Washington; and Boise, Idaho.

Systematics.—Abdominal markings vary considerably. All males seen

have at least some red on T-I–II and some are red also on T-III–IV. The majority of females have the abdomen all red except at the base of I, but about a third have some black on V–VI or IV–VI. Best species characters are the combination of all pale clypeus and distinctive propodeal enclosure in both sexes (Fig. 11), and features of F-I and F-XI in the male (Figs. 7, 9).

Dienoplus pueblicus, new species
(Fig. 13)

Male holotype.—Length 5 mm; mahogany red; black are: large ventral area of mesopleuron; dark brown are: flagellum above, femora narrowly above, tarsi, wing veins; white are: forewing stigma, lateral spot on T-II, median spot on T-V; wings nearly clear, a little dusky in marginal cell. Pubescence inconspicuous and silvery, most noticeable laterally on propodeum. Punctation fine to moderate, some coarse punctures on mesopleuron, moderate and well spaced ones on scutum and T-II, especially at sides. F-I about 1.7 times as long as broad, longer than F-II; F-XI slightly concave beneath; propodeal enclosure nearly flat, median sulcus faint, a series of short carinulae from anterior margin, the two which border the sulcus extending nearly halfway back (Fig. 13); S-VIII narrow and parallel-sided (as in Fig. 4).

Female.—Length 6 mm; about as in male except: F-IV–X dark reddish brown, a trace of soot-like micropubescence on metanotum; pygidial plate minutely sculptured, with coarse and separated punctures.

Holotype male (UCD) and one female paratype, 3 mi N Petlalcingo, Puebla, Mexico, August 3, 1963 (F. D. Parker, L. A. Stange). One male paratype, Guanajuato, Mexico (E. Duges, returned to J. Leclerq).

Systematics.—Among the *gyponae* group, *pueblicus* differs by the separated coarse punctures of the mesopleuron, unmarked hindtibia, short carinulae on the propodeal enclosure (Fig. 13), and narrow male S-VIII (as in Fig. 4).

Dienoplus rugulosus, new species
(Figs. 2, 4, 5, 10)

Male holotype.—Length 5 mm; black; red are: T-I–II mostly, S-II partly; yellow are: mandible spot, labrum, clypeus except for broad subbasal spot (Fig. 2), frons laterally, fore and midtibia in front; wings slightly stained. Pubescence silvery, inconspicuous. Punctation moderate and well spaced on frons, scutum and T-II laterally; coarse and well spaced on mesopleuron. F-I about twice as long as broad, about as long as F-II (Fig. 10); F-XI slightly concave beneath; propodeal enclosure with complete longitudinal rugulae which are continued laterally over rounded part of propodeum (Fig.

5); posterior propodeal surface shiny but microsculptured; S-VIII narrow (Fig. 4).

Female.—Length 5–7 mm; about as in male except: clypeus often and legs sometimes all dark, abdomen all red beyond extreme base; pygidial plate partly shiny but with slightly spaced micro- and macropunctuation.

Holotype male (UCD), Davis, Yolo Co., California, August 3, 1955 (R. K. Washino). Paratypes, 14 male and 19 female topotypes, April 28–June 11 and July 17–November 27 (F. Parker, J. Downey, E. Schlinger, A. MacClay, A. Grigarick, M. Irwin, A. Menke, P. Marsh, R. Bohart). Other material, 14 pair from widespread localities in California from Lower Sonoran to Canadian Life Zone localities. Out-of-state specimens are 11 males, 9 females from Washington (Pullman, Walla Walla), Idaho (Sweet, Notus, Owyhee Co., Twin Falls Co.), Oregon (Josephine), Utah (Petersboro, 12 mi W Tremonton, Park Valley), and Nevada (Verdi; Orovada, 16 mi NW Gerlach, Humboldt Co., Douglas Co.).

Systematics.—Most males have T-I–II red, the rest black. However, I have seen seven males from California and Nevada with the abdomen all black. Females, on the other hand, seem to have all segments red except at the base of I and sometimes on VI. The propodeal rugulae extend onto the rest of the propodeum to a variable degree, but at least cover the rounded lateral areas (Fig. 5). Both sexes customarily have a dark blotch on the clypeus, or in females it may be all black. Oddly, two males with all black abdomen have the clypeus all yellow.

Dienoplus russulus, new species

(Figs. 1, 8)

Male holotype.—Length 5 mm; light brownish red; black are: fore and midtibiae posteriorly, fore and midtarsi partly, hindtarsi; whitish are: scape beneath, fore and midtarsi in front, long basoposterior hindtibial spot, small lateral spot on T-II, median spot on T-V; wings mostly clear, dusky in marginal cell, veins brown, stigma whitish yellow. Body with extensive but mostly inconspicuous silvery micropubescence, prominent on mesopleuron and propodeal side, some obscure dark micropubescence on scutum and T-III–IV. Punctuation fine and inconspicuous. F-I a little more than twice as long as broad, longer in every view than F-II; F-XI slightly concave beneath (Fig. 8); propodeal enclosure finely microsculptured, divided by a longitudinal sulcus (as in Fig. 12); S-VIII slightly broadened (Fig. 1).

Female.—Length 5–6 mm; about as in male except: labrum, clypeus, lateral stripes on lower frons, broader median spot on T-V, whitish; some sootlike pubescence on metanotum; pygidial plate mostly smooth, scattered medium punctures.

Holotype male (UCD), 18 mi W Blythe, Riverside Co., California, Oc-

tober 14, 1967, on *Euphorbia* mat (R. M. Bohart). Paratypes, 5 female topotypes, April 16, October 14–16 (P. Hurd, F. Parker, R. Bohart). 2 males, Thousand Palms, Riverside Co., April 4–9, on *Euphorbia* mats (F. Parker, R. Bohart). Other material, 13 males, 3 females, CALIFORNIA: Redlands, Glamis, 18 mi W Blythe; NEVADA: 18 mi W Denio, 15 mi E Reno, Patrick; NEW MEXICO: Albuquerque; COLORADO: Colorado Springs; KANSAS: Stafford Co. (Salt Flats), Kearny Co. (Lake McKinney); CHIHUAHUA: 9 mi S Hidalgo del Parral.

Systematics.—There is considerable variation in amount of black markings. The type series has a minimum, with little on the propodeum and the ocelli merely rimmed or surrounded by a small ocellar blotch. However, other specimens from Glamis, 18 mi W Blythe, and western Nevada may have the propodeal enclosure all black, at least in males. Within the *gyponae* group, *russulus* is best characterized by a combination of the fine mesopleural punctation, sharply defined hindtibial white mark, simple longitudinal groove on the propodeal enclosure (as in Fig. 12), and slightly broadened male S-VIII (Fig. 1).

Dienoplus sinopsis, new species
(Figs. 6, 12)

Male holotype.—Length 5 mm; light brownish red; black are: antenna above, ocellar area, adjacent and slightly posterior ocular spot, irregular areas behind wing base and in propodeal spiracle area, posterior spot on propodeal enclosure, spot behind pronotal lobe, venter of mesopleuron, dorsal stripes on femora, tibiae and tarsi partly, S-IV–VI and S-VIII; whitish are: clypeus, mandible, labrum, lower frons, fore and midtibiae in front, hindtibia posterobasally, large lateral spot on T-II, broad spot on T-V; wings smoky, venation brown, stigma pale yellow. Body with extensive, short, silvery pubescence. Punctation fine and inconspicuous. F-I about twice as long as broad, F-XI slightly concave beneath (as in Fig. 8), propodeal enclosure polished and divided by a longitudinal sulcus (Fig. 12), S-VIII unusually stout (Fig. 6).

Female.—Length 5–6 mm; about as in male except: clypeus mostly reddish, antenna darker with F-VI–X all dark, S-IV–VI reddish, pubescence of metanotum black and sootlike, some black micropubescence on T-II–IV, pygidial plate mostly smooth, scattered medium punctures.

Holotype male (UCD), 1 mi S Soledad, Monterey Co., California, May 1, 1968 (R. M. Bohart). Paratypes, 20 males, 3 females, topotypical but collected from April 11–May 15 (J. MacSwain, R. Thorp, C. Goodpasture, R. Bohart). Other paratypes, 2 males, 1 female, Pinnacles, San Benito Co., CA, May 25, 1956 (P. Hurd); Ventura Co., CA: 2 pair, Chuchupate Ranger Station, Frazier Mountains, May 4–5, 1959 (P. Hurd, J. Powell); 1 pair,

Lockwood Valley, May (E. Schlinger, G. Stage); 3 males, 2 females, Hungry Valley, 5 mi S Gorman, May 4–6, 1959 (P. Hurd, C. O'Brien, G. Stage).

Systematics.—The best single recognition feature of the species is the broadened male S-VIII (Fig. 6). This can be detected even if it is exerted only slightly. Otherwise, *sinopsis* differs from others in the *gyponae* group by the simple groove of the propodeal enclosure (Fig. 12), fine mesopleural punctation; darkened distal sterna in the male and distal flagellomeres in the female, and the absence of a discrete pale basoposterior spot on the female hindtibia.

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